

What is claimed is:

1. A coordinator polling list making apparatus comprises:

a controlled contention frame transmitter, which when making a polling list is requested, generates a controlled contention frame and transmits the controlled contention frame to stations on a network through a predetermined channel using a broadcast method after a period of time corresponding to a priority inter-frame space lapses since receipt of the request of making a polling list;

a reservation request frame receiver, which receives a reservation request frame from each of the stations through the predetermined channel as a response to the controlled contention frame during a controlled contention interval designated by the controlled contention frame; and

a polling list making unit, which when the reservation request frame receiver receives the reservation request frame, allocates a poll frame transmission sequence to the stations, from which the reservation request frame is received, using a first come first serve method based on a sequence in which reservation request frames arrive and makes a polling list comprising the poll frame transmission sequence.

2. The coordinator polling list making apparatus of claim 1, further comprising:

a polling frame making request unit, which requests to make the polling list when the polling list is not made or when all reservation request frames are not received from the stations having transmitted the reservation request frames during the controlled contention interval; and

a poll frame transmitter, which transmits a poll frame to each of the stations, having transmitted the reservation request frames that are received by the reservation request frame receiver, through the predetermined channel according to the poll frame transmission sequence comprised in the polling list made by the polling list making unit.

3. The coordinator polling list making apparatus of claim 2, wherein a length of the controlled contention interval is proportional to the number of stations on the network.

4. The coordinator polling list making apparatus of claim 2, wherein the network is a basic service set defined in IEEE 802.11 wireless LAN standards.

5. The coordinator polling list making apparatus of claim 4, wherein the controlled contention frame comprises a frame control field, a period/ID field, a

receiver address field, a basic service set ID field, a controlled contention interval length field, and a frame inspection sequence field;

the reservation request frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, an association ID field, and a frame inspection sequence field;

the poll frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, a data transmitting/receiving period length field, and a frame inspection sequence field; and

the quality of service control field indicates a data rate, a burst size, a delay bound, and a jitter bound.

6. A station polling list making apparatus comprising:

a controlled contention frame receiver, which receives a controlled contention frame through a predetermined channel from a coordinator station among stations on a network; and

a reservation request frame transmitter, which when the controlled contention frame is received by the controlled contention frame receiver, contends for use of the predetermined channel according to a user priority value of a data frame during a controlled contention interval designated by the controlled contention frame so as to acquire an exclusive right of using the predetermined channel, generates a reservation request frame as a response to the controlled contention frame when the exclusive right is acquired, and transmits the reservation request frame to the coordinator station through the predetermined channel.

7. The station polling list making apparatus of claim 6, the reservation request frame transmitter sets a coordination inter-frame space value and a contention window value according to the user priority value, detects whether the predetermined channel is being used after a period of time corresponding to the coordination inter-frame space value and a back-off time corresponding to the contention window value lapse, acquires the exclusive right of using the predetermined channel if the predetermined channel is not being used, and does not acquire the exclusive right of using the predetermined channel and resets the contention window value to be extended using a back-off algorithm if the predetermined channel is being used.

8. The station polling list making apparatus of claim 6, further comprising:

a poll frame receiver, which receives a poll frame transmitted through the predetermined channel from the coordinator station according to polling frame transmission sequence comprised in a polling list; and

a data frame transmitter, which when the poll frame is received by the poll frame receiver, transmits the data frame to a destination station among the stations through the predetermined channel during a data transmitting/receiving period designated by the poll frame.

9. The station polling list making apparatus of claim 8, wherein a length of the controlled contention interval is proportional to the number of stations.

10. The station polling list making apparatus of claim 8, wherein the network is a basic service set defined in IEEE 802.11 wireless LAN standards.

11. The station polling list making apparatus of claim 10, wherein the controlled contention frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a controlled contention interval length field, and a frame inspection sequence field;

the reservation request frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, an association ID field, and a frame inspection sequence field;

the poll frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, a data transmitting/receiving period length field, and a frame inspection sequence field; and

the quality of service control field indicates a data rate, a burst size, a delay bound, and a jitter bound.

12. An apparatus for making a polling list, comprising:

a coordinator polling list making apparatus, which when making a polling list is requested, generates a controlled contention frame and transmits the controlled contention frame to stations on a network through a predetermined channel using a broadcast method after a period of time corresponding to a priority inter-frame space lapses since receipt of the request of making a polling list, and when a reservation request frame from each of the stations is received as a response to the controlled contention frame through the predetermined channel during a controlled contention interval designated by the controlled contention frame, allocates a poll frame transmission sequence to the stations, from which the reservation request frame is received, using a first come first serve method based on a sequence in which

reservation request frames arrive and makes a polling list comprising the poll frame transmission sequence; and

5 a station polling list making apparatus, which when the controlled contention frame is received through the predetermined channel from the coordinator polling list making apparatus, contends for use of the predetermined channel according to a user priority value of a data frame during the controlled contention interval designated by the controlled contention frame so as to acquire an exclusive right of using the predetermined channel, and when the exclusive right is acquired, generates a reservation request frame as a response to the controlled contention  
10 frame and transmits the reservation request frame to the coordinator polling list making apparatus through the predetermined channel.

13. The apparatus of claim 12, wherein the coordinator polling list making apparatus requests to make the polling list when the polling list is not made or when  
15 all reservation request frames are not received from the stations having transmitted the reservation request frames during the controlled contention interval, and transmits a poll frame to each of the stations, having transmitted the reservation request frames that are received, through the predetermined channel according to the poll frame transmission sequence comprised in the polling list; and

20 when the station polling list making apparatus receives the poll frame transmitted through the predetermined channel from the coordinator polling list making apparatus according to the polling frame transmission sequence comprised in the polling list, the station polling list making apparatus transmits the data frame to a destination station among the stations through the predetermined channel during a  
25 data transmitting/receiving period designated by the poll frame.

14. The apparatus of claim 13, wherein a length of the controlled contention interval is proportional to the number of stations.

30 15. The apparatus of claim 13, wherein the network is a basic service set defined in IEEE 802.11 wireless LAN standards.

16. The apparatus of claim 15, wherein the controlled contention frame comprises a frame control field, a period/ID field, a receiver address field, a basic  
35 service set ID field, a controlled contention interval length field, and a frame inspection sequence field;

the reservation request frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, an association ID field, and a frame inspection sequence field;

the poll frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, a data transmitting/receiving period length field, and a frame inspection sequence field; and

the quality of service control field indicates a data rate, a burst size, a delay bound, and a jitter bound.

17. A method of making a coordinator polling list, comprising:

when making a polling list is requested, generating a controlled contention frame and transmitting the controlled contention frame to stations on a network through a predetermined channel using a broadcast method after a period of time corresponding to a priority inter-frame space lapses since receipt of the request of making a polling list;

receiving a reservation request frame from each of the stations as a response to the controlled contention frame through the predetermined channel during a controlled contention interval designated by the controlled contention frame;

when the reservation request frame is received, allocating a poll frame transmission sequence to the stations, from which the reservation request frame is received, using a first come first serve method based on a sequence in which reservation request frames arrive and making a polling list comprising the poll frame transmission sequence.

18. The method of claim 17, further comprising:

requesting to make the polling list when the polling list is not made or when all reservation request frames are not received from the stations having transmitted the reservation request frames, before generating the controlled contention frame during the controlled contention interval; and

transmitting a poll frame to each of the stations, having transmitted the reservation request frames that are received, through the predetermined channel according to the poll frame transmission sequence comprised in the polling list, after making the polling list.

19. The method of claim 18, wherein a length of the controlled contention interval is proportional to the number of stations.

20. The method of claim 18, wherein the network is a basic service set defined in IEEE 802.11 wireless LAN standards.

21. The method of claim 20, wherein the controlled contention frame  
5 comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a controlled contention interval length field, and a frame inspection sequence field;

the reservation request frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control  
10 field, an association ID field, and a frame inspection sequence field;

the poll frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, a data transmitting/receiving period length field, and a frame inspection sequence field; and

the quality of service control field indicates a data rate, a burst size, a delay  
15 bound, and a jitter bound.

22. A method of making a station polling list, comprising:

(a) receiving a controlled contention frame through a predetermined channel from a coordinator station among stations on a network; and

(b) when the controlled contention frame is received, contending for use of the  
20 predetermined channel according to a user priority value of a data frame during a controlled contention interval designated by the controlled contention frame so as to acquire an exclusive right of using the predetermined channel, generating a reservation request frame as a response to the controlled contention frame when the  
25 exclusive right is acquired, and transmitting the reservation request frame to the coordinator station through the predetermined channel.

23. The method of claim 22, wherein step (b) comprises setting a coordination inter-frame space value and a contention window value according to the  
30 user priority value, detecting whether the predetermined channel is being used after a period of time corresponding to the coordination inter-frame space value and a back-off time corresponding to the contention window value sequentially lapse, acquiring the exclusive right of using the predetermined channel if the predetermined channel is not being used, and resetting the contention window value to be extended  
35 using a back-off algorithm when the exclusive right of using the predetermined channel is not acquired because the predetermined channel is being used.

24. The method of claim 22, further comprising:

(c) receiving a poll frame transmitted through the predetermined channel from the coordinator station according to polling frame transmission sequence comprised in a polling list; and

(d) when the poll frame is received, transmitting the data frame to a destination station among the stations through the predetermined channel during a data transmitting/receiving period designated by the poll frame.

25. The method of claim 24, wherein a length of the controlled contention interval is proportional to the number of stations.

26. The method of claim 24, wherein the network is a basic service set defined in IEEE 802.11 wireless LAN standards.

27. The method of claim 26, wherein the controlled contention frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a controlled contention interval length field, and a frame inspection sequence field;

the reservation request frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, an association ID field, and a frame inspection sequence field;

the poll frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, a data transmitting/receiving period length field, and a frame inspection sequence field; and

the quality of service control field indicates a data rate, a burst size, a delay bound, and a jitter bound.

28. A method of making a polling list, comprising:

(a) when making a polling list is requested, generating a controlled contention frame and transmitting the controlled contention frame to stations on a network through a predetermined channel using a broadcast method after a period of time corresponding to a priority inter-frame space lapses since receipt of the request of making a polling list, and when a reservation request frame from each of the stations is received as a response to the controlled contention frame through the predetermined channel during a controlled contention interval designated by the controlled contention frame, allocating a poll frame transmission sequence to the stations, from which the reservation request frame is received, using a first come first serve method based on a sequence in which reservation request frames arrive and making a polling list comprising the poll frame transmission sequence; and

(b) when the controlled contention frame is received through the predetermined channel, contending for use of the predetermined channel according to a user priority value of a data frame during the controlled contention interval designated by the controlled contention frame so as to acquire an exclusive right of using the predetermined channel, and when the exclusive right is acquired, generating a reservation request frame as a response to the controlled contention frame and transmitting the reservation request frame to the coordinator polling list making apparatus through the predetermined channel.

29. The method of claim 28, wherein step (a) comprises requesting to make the polling list when the polling list is not made or when all reservation request frames are not received from the stations having transmitted the reservation request frames during the controlled contention interval, and transmitting a poll frame to each of the stations, having transmitted the reservation request frames that are received, through the predetermined channel according to the poll frame transmission sequence comprised in the polling list; and

step (b) comprises when the poll frame transmitted through the predetermined channel according to the polling frame transmission sequence comprised in the polling list is received, transmitting the data frame to a destination station among the stations through the predetermined channel during a data transmitting/receiving period designated by the poll frame.

30. The method of claim 29, wherein a length of the controlled contention interval is proportional to the number of stations.

31. The method of claim 29, wherein the network is a basic service set defined in IEEE 802.11 wireless LAN standards.

32. The method of claim 31, wherein the controlled contention frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a controlled contention interval length field, and a frame inspection sequence field;

the reservation request frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, an association ID field, and a frame inspection sequence field;

the poll frame comprises a frame control field, a period/ID field, a receiver address field, a basic service set ID field, a quality of service control field, a data transmitting/receiving period length field, and a frame inspection sequence field; and



the quality of service control field indicates a data rate, a burst size, a delay bound, and a jitter bound.

5        33.     A computer readable recording medium having embodied therein a computer program for the method of claim 17.

      34.     A computer readable recording medium having embodied therein a computer program for the method of claim 22.

10       35.     A computer readable recording medium having embodied therein a computer program for the method of claim 28.